PROBABILITY AND STATISTICS

Course Outcome:

Students who successfully complete this course should be able to demonstrate understanding of:

1. basic probability axioms and rules and the moments of discrete and continuous random variables as well as be familiar with common named discrete and continuous random variables.
2. how to derive the probability density function of transformations of random variables and use these techniques to generate data from various distributions.
3. how to calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.
4. discrete time Markov chains and methods of finding the equilibrium probability distributions.
5. how to calculate probabilities of absorption and expected hitting times for discrete time Markov chains with absorbing states.

UNIT - I

Descriptive Statistics: Basic Definitions, Frequencies, Graphical Representation, Histogram, Ogive curves, Measures of Central tendency, Arithmetic mean, Median, Mode, mean deviation, standard deviation, Symmetry and Skewness, Karl Pearson’s Coefficient of skewness.

UNIT - II

Curve Fitting and Correlation, Regression: Least squares method, curve fitting (straight line and parabola only) Covariance, Correlation, Types, Pearson’s Coefficient of correlation, Rank correlation, Spearman’s rank correlation. Regression, Regression lines, multiple regression.

UNIT - III

Probability: Introduction, Definition (Classical and Axiomatic approach), Addition theorem, Conditional probability, Multiplication theorem, Total probability, Bayes theorem.

UNIT - IV

Distributions: Random variables, Discrete and Continuous variables, Introduction to Distributions

Binomial Distribution: Definition, Mean and Standard deviation, Recurrence relation, Applications, Fitting of binomial distribution.
Poisson Distribution: Definition, Mean and Standard deviation, Recurrence relation. Poisson Distribution is an approximation of Binominal distribution, Applications, Fitting of Poisson distribution.

Geometric Distribution: Definition, Properties.

Normal Distribution: Definition, Normal curve, Mean and Standard deviation, Median, Mode, Normal Distribution applications, Normal Distribution is an approximation to Binomial distribution.

Exponential Distribution: Definition, Properties.

UNIT - V


Test of hypothesis and test of significance, confidence limits, confidence interval, Test of significance of large samples, T-distribution, Chi square test.

TEXT BOOKS


REFERENCE BOOKS